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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/796,175	03/10/2004	Hiroshi Arakawa	H-1132	3510

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MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C.
1800 DIAGONAL ROAD
SUITE 370
ALEXANDRIA, VA 22314

EXAMINER

WU, YICUN

ART UNIT	PAPER NUMBER
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2165

DATE MAILED: 07/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/796,175

Applicant(s)

ARAKAWA ET AL.

Examiner

Yicun Wu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-5,7,9,11 and 12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,7 and 9 is/are rejected.
- 7) ☒ Claim(s) 3-5,11 and 12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3-10-04 9-9-04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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III. DETAILED ACTION

1. Claims 1, 3-5, 7, 9, 11-12 are presented for examination.

Drawing

2. Drawings are acceptable for examination purpose.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over LaRue et al. (U.S. Patent 6,449,622) in view of Bauer et al. (U.S. Patent 5,926,816).

As to Claims 1 and 7, LaRue et al. discloses a system for copying data between a plurality of storage systems, comprising:

a first storage system (fig. 2 and Col. 8, lines 30-67) coupled to a plurality of computers (fig. 2), which comprises a first logical volume storing data received from

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a plurality of computers (fig. 2 and Col. 8, lines 30-67);
and

a second storage system coupled the first storage system (fig. 2 and Col. 8, lines 30-67), which comprises a second logical volume storing copy data of data stored in the first logical volume (fig. 2 and Col. 8, lines 30-67);

wherein the plurality of computers include at least one computer issuing a write request (i.e. client changes. fig. 3) including a write time (i.e. client version indicator9s). fig. 3) and at least one other computer issuing a write request without a write time (fig. 2-3),

when a write time is included in a write request received from one of the plurality of computers (fig. 3, item 320), the first storage system records the write time (fig. 3, item 320) and sends write data and the write time to the second storage system (fig. 3),

sends the write data with the write time to the second storage system (fig. 3); and

the second storage system stores the write data received from the first storage system in the second logical volume in an order based on the write time received from the first storage system (fig. 3, item 320).

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LaRue et al. does not teach when a write time is not included in the write request, the first storage system assigns a write time recorded by the first storage system to the write data.

Bauer et al. teaches when a write time is not included in the write request, the first storage system assigns a write time recorded by the first storage system to the write data.

(i.e. The refresh timestamp (rt) is initially null and is updated) (col. 9, line 17-20).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified LaRue et al. with when a write time is not included in the write request, the first storage system assigns a write time recorded by the first storage system to the write data.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified LaRue et al. by the teaching of Bauer et al. because providing when a write time is not included in the write request, the first storage system assigns a write time recorded by the first storage system to the write data allows time efficient, easy to maintainm, general and

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reliable solution to recover from errors and system crashes as taught by Bauer et al. (col. 1, lines 42-46).

As to Claim 9, LaRue et al. as modified teaches a system wherein

the first storage system sends a completion report to at least one of the Plurality of computers after receiving a report of reception of the write data from the second storage system (LaRue et al. fig. 3, item 320).

Allowable subject Matter

5. Claims 3-5 and 11-12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record LaRue et al. (U.S. Patent 6,449,622) and in combination with Bauer et al. (U.S. Patent 5,926,816) does not disclose, teach or suggest the claimed limitations of (in combination with all other features in the claims):

the first storage system comprises a plurality of the first logical volumes, the second storage system comprises a plurality of the second logical volumes, a plurality of logical volume groups are provided each the group including at least one the first logical volume and at least one the second logical volume, and further wherein the second storage system, in respect of each of the plurality of logical volume groups, records a latest write time in the

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write times assigned to the write data to be stored in a-
the second logical volumes in each of the logical volume
groups sequentially, selects the oldest write time from
among the write times stored as the latest write time for
each of the logical volume groups, identifies the write
data, to which a write time has been assigned that is
earlier than the selected oldest latest write time, and
stores the identified write data in its respective the
second logical volume, as claimed in claim 3.

The prior art of record LaRue et al. (U.S. Patent
6,449,622) and in combination with Bauer et al. (U.S.
Patent 5,926,816) does not disclose, teach or suggest the
claimed limitations of (in combination with all other
features in the claims):

a plurality of logical volume groups are provided,
with each logical volume group including at least one of
the second logical volume and one the third logical volume,
and further wherein the third storage system, in respect of
each of the plurality of logical volume groups, records a
latest write time that is closest to the current time in
the write times assigned to the write data to be stored in
a third logical volume in the logical volume group

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sequentially for each of the logical volume groups, selects the oldest write time from among the latest write times which have been recorded for each of the logical volume groups, and identifies write data, having a write time earlier than the selected oldest write time, and stores the identified write data in its respective the third logical volume as claimed in claim 12.

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Other Prior Art Made of Record

7. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure. U.S. patents and U.S. patent application publications will not be supplied with Office actions.

Examiners advises the Applicant that the cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site (www.uspto.gov <<http://www.uspto.gov/>>), from the Office of Public Records and from commercial sources. For the use of the Office's PAIR system, Applicants may refer to the Electronic Business Center (EBC) at <http://www.uspto.gov/ebc/index.html> or 1-866-217-9197.

Chandrasekaran (U.S. Patent No. 6,823,347);

Demers et al. (U.S. Patent No. 5,577,240); and

Zondervan et al. (U.S. Patent No. 6,516,327).

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Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yicun Wu whose telephone number is 571-272-4087. The examiner can normally be reached on 8:00 am to 4:30 pm, Monday -Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Gaffin can be reached on 571-272-4146. The fax phone numbers for the organization where this application or proceeding is assigned are 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2100.

Yicun Wu
Patent Examiner
Technology Center 2100


JEFFREY GAFFIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

July 20, 2005